ASSESSMENT OF QUALITY MANAGEMENT SYSTEM AND ITS PRACTICE IN PLASTIC INDUSTRIES: THE CASE OF ADDIS ABABA

By:

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Declaration

I, Desalegn Sete, hereby that this thesis entitled **''Assessment of quality management system and its practice in plastic industries: the case of Addis Ababa''** was composed by myself, with the guidance of my advisor, that the work contained herein my own except where explicitly stated otherwise in the text, and that this work has not been submitted, in whole or in part, for any other degree or processional qualification.

Desalegn Sete

Name Signature, Date

Certification

This is to certify that the thesis prepared by Mr. **Desalegn Sete Tefera** entitled **''Assessment of quality management system and its practice in plastic industries: the case of Addis Ababa''** and submitted in fulfillment of the requirements for the Degree of Master of Science complies with the regulation of the University and meets the accepted standards with respect to originality and quality.

Approved by board of examiners

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Internal examiner: Signature, Date:

ABSTRACT

The purpose of this study was to assess the quality management systems practice and gaps in ISO QMS certified plastic firms located in Addis Ababa Ethiopia. To this end, a descriptive survey design was employed. The total population of the study was ten plastic product manufacturing firms which certified by ISO 9001 QMS and from these four factories were selected randomly to give equal opportunity and for the those plastic product manufacturing firms, 92 questioner were distributed to key person who had information about ISO 9001 implementation in their respective firms using purposive random sampling by departments and convenient sample that represented the population but out of 92 questionnaire 78 was returned. The data was gathered via means of questionnaire and interview. Data obtained through questionnaires were analyzed using SPSS version 20 statistical data analysis tools and data obtained through personal interview was interpreted descriptively. Cronbch alpha was used to determine scale validity and reliability and the collected data was analyzed using SPSS. The study identify key gaps during implementation of QMS with their respected firms like, lack of corrective action and preventive action, less involvement of people and lack of continual improvement, lack of promotion and incentives, lack of trainings in using of QMS as improvement tools are the major gaps that found needs to improve to boost the overall performance and for continual improvement of the firms.

Key words: Gaps, Quality management system, ISO, PDCA cycle,

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LIST OF ABBREVIATIONS

QMS	Quality Management System
ISO	International Standards Organization
UNIDO	United Nations Industrial Development Organization
PDCA	Plan - Do - Check - Act
WTO	World Trade Organization
SPC	Statistical Process Control
EMS	Environmental Management System
TC	Technical Committee
US	United States
NATO	North Atlantic Treaty Organization
AQAP	Allied Quality Assurance Publications
HLS	High Level Structure
IAF	International Accreditation Forum
NGOs	Non Governmental Organizations
IT	Information Technology
QMP	Quality Management Principles

IS	International Standard
GDP	Gross Domestic Product
MSS	Management System Standards
PLC	Private Limited Company
FDRE	Federal Democratic Republic of Ethiopia
DQS	No extension just it is a certifying agency
ISOQAR	ISO- Quality Assurance Registered
SPSS	Statistical Package for Social Sciences
SFS-EN	Prefix to indicates the same standard is valid both in Finland and Europe
GMP	Good Manufacturing Practice

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Several quality authors study and define the word quality with their related profession. Quality is the most significant factor in the success of construction projects (Ali and Rahmat, 2010). QMS is an appropriate quality management and marketing tools for developing and improving organization performance. In construction, it is suggested to implement QMS standard in the projects to improve organization performance (Behnam Neyestani, 2016). The pharmaceutical industry moves in to different forms of partnerships and vendor arrangements the implementation of a structured quality management system in drug safety, regulatory affairs, and medical affairs is necessary in order to guarantee compliant delivery of services and products. The pharmaceutical industry is amongst most astringently regulated manufacturing units (Daniel Amare, 2010). A standard regulating handling of food fulfills the requirements of current food legislation, but it also adds value to the production (Miljöstyrningsrådet, 2007). A standard provides a method of preventing problems and crisis and it can also help to handle requirements from authorities, the market and others (Lusk et al, 2011). According to Bergström and Hellqvist (2004), it also helps the manufacturer or company to create new opportunities, to get into new markets and start producing for new consumers. The company will also earn an increased trust among customers and will ensure the communication to authorities that may not have been the case as an uncertified business.

Nowadays it is obvious that more emphasis is placed on quality issues than ever before. To be competitive in today's market, it is essential for the company to provide more consistent

quality product and value to its customers (Henok Mesfin, 2013). The total quality infrastructure consists of several key pieces. The first and one of the most important is the quality system (Juran and Godfrey, 1999) as a business management tool. In 1987, the first edition of the quality system was introduced by the international organization for standardization (ISO) to aim quality and customer's satisfaction improvement. According to ISO 9000 or "quality management principles" are a set of fundamental beliefs, norms, rules and values that are accepted as true and can be used as a basis for quality management (ISO, 2015). According to the latest survey of ISO (2014), 1,609,294 ISO certificates were issued, and the majority of them belonged to QMS standard or 1,138,155 ISO 9001 certificates issued that met the requirements of QMS under external audit of a third party or Certification Body.

Plastic industries are one of those ISO quality management system certified firms. Plastics are an essential part of modern life; increased living standards, growing environmental awareness, and sustainable development thinking are driving the demand for new and innovative material solutions (Industry over view, the plastic industry in Germany issue 2016/2017). Global plastics demand is forecast to grow five percent annually through to 2015 as a result of global megatrends including urbanization, energy demand, climate change, and new technology developments. The different megatrends driving growth are closely linked to industry sectors including construction, energy efficiency and housing areas in which plastics are playing an ever-increasing role (Industry over view, the plastic industry in Germany issue 2016/2017).

The Ethiopian government has demonstrated impressive dedication and ability to create the preconditions for a market based and socially inclusive industrial transformation. It is strongly and credibly committed to investing in technological learning in order to build new

competitive advantages and leave the history of feudalism and rent-seeking behind. Improvements for the vast majority of the rural poor are at the center of the government's project for societal transformation (Tilman Altenburg, 2017). In Ethiopia, there are 580 and above plastic industries (F.D.R.E Chemical and construction inputs industry development institute report, 2018). From those industries, 16 firms only certified ISO quality management system from three ISO certified agents, six firms from Ethiopian conformity assessment enterprise, eight of them from alcumus ISOQAR, and also two of them from DQS Ethiopia. This study was carried out gaps in those ISO certified plastic firms implementing quality management system.

1.2. Statement of the problem

Quality management system implemented in today's circumstances within the organizations with respect to different international standards. According to ISO 9001: 2008 QMS Certification is more as a marketing tool certificate in the organization from any certification body, which is not consistent about the rather than the need of quality management/ system improvement (Procedia Social and Behavioral Sciences 189 (2015) 320 - 334).

ISO 9001 can improve the efficiency of the processes of the organizations by generic guidance and documentations, and continual improvement through "Plan-Do-Check-Act" (PDCA) methodology to achieve successfully the satisfaction of customer and quality objectives. Unfortunately, most companies in developing countries believe establishing QMS is just useful to have its certification as a market tool. sorry to say, the most of the managers emphasized on implementing QMS certification (ISO 9001 certification) only, and often neglect to use other standards of QMS (Behnam Neyestani, 2016). Therefore, the managers often focus on the certification as the primary objective and requirement more than the value in the quality

management process, and this kind of the idea can cause inefficient operation and lack of an effective QMS. The other side customer is also not aware of the requirements of the standards and/or not looking much conscious to see the consistency of the ISO certificate which the supplier is having. Hence, it looks some loopholes in the values of the whole implementation of QMS if we are keeping ISO certifications at the center point. Hence, how the quality management practices implemented within the firms? The research identifies the actual implementation level of QMS, drives throughout the firms.

1.3. Basic research questions

The major research questions this study were addressed;

- What gaps the company does in the implementation of quality management system?
- Where in its operation does the firm need more attention in implementing QMS?
- What are the potential areas of the firm in implementing QMS for continual improvement?

1.4. Objectives of the study

The general objective of this study is to assess the quality management systems practice in ISO QMS certified plastic product manufacturing firms. And further the study achieved the following specific objectives:

- Assess and review the gap of the company with respect to quality management system practice.

- Critically examine and identify where the firm needs more attention in its operation through implementing QMS.
- Identify the potential areas for improvement and values due implementing quality management system.

1.5. Significance of the Study

The significance of this study can be expressed in terms of its relevance to the need that arose to conduct the research and the benefits that it will give both to the body of knowledge in the field of study and to the industry as well. Primarily this paper provides the knowledge needed by plastic manufacturing companies how to overcome the gaps faced while implementing ISO 9001. And also the study provides information for researchers who intent to examine the implementation of ISO 9001 QMS empirically.

Recently Ethiopian manufacturing organizations are demanded to improve their products quality in order to improve their competitiveness and verify the current strategy of the government to export their products abroad. In the same time, the government opened the Ethiopian market to receive a variety of foreign products from different markets. Therefore, the product quality has emerged as a key issue in most of the Ethiopian manufacturing industry and they have started implementing QMS to survive up with pressures from foreign competitors and improve their competitiveness. To support their effort towards higher quality levels, it is important to evaluate the QMS practices implemented in such plastic firms.

1.6. Scope of the study

This research study included the plastic product manufacturing firms which are ISO QMS certified located only in Addis Ababa up to March 2018 only. Since the research was selected two issues together the gap and the potential areas of the firms in implementing QMS. Hence to get a full information and data the study included managers and employees of certified firms were subjected to be part of this study. However, relevant literature that was used came from all around the world to best understand quality systems and techniques.

1.7. Limitations

The major limitation of this research was; it covers only ISO QMS certified plastic product manufacturing companies found in Addis Ababa and excluded other ISO QMS certified plastic company found out of Addis Ababa. And in addition to this responded of some of the respondents were not encouraging, due to fear on the interview part of the respondents and lack of experience of the researcher in the area were the limitations of the study.

1.8. Organization of the thesis

The paper was organized with five chapters. The first chapter covers the introduction part that addresses the background information concerning QMS, the research questions, the general and specific objectives of the research, the significance, and scope of the research, and finally the limitations of the research. Following this introductory chapter, the second chapter described the basic and relevant literature related to QMS practices.

In the third chapter, the research report covers the type of research design used, the analysis of the data, the sampling techniques, and methods of data collection applied. The fourth chapter focuses on the descriptive data analysis and findings of the study and the last chapter provided conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

According to ISO 9000 the quality management system is defined as a system "to direct and control an organization with regard to quality." (SFS-EN ISO 9000, 8). As early as the 1950s, Japanese companies began to see the benefits of emphasizing quality throughout their organizations and enlisted the help of an American, W. Edwards Deming, who is credited with giving Japanese companies a massive head start in the quality movement. Hismethods include statistical process control (SPC) and problem-solving techniques that were very effective in gaining the necessary momentum to change the mentality of organizations needing to produce high-quality products and services (www.abahe.co.uk). Deming believed that 85 percent of all quality problems were the fault of management. In order to improve, management had to take the

lead and put in place the necessary resources and systems. Several quality authors have defined quality in various ways considering different attributes of a product. Some definitions are listed here under (D. Sarkar, 2000). Juran: "Fitness for purpose" or" Quality is customer satisfaction." Deming: "Quality should be aimed at the needs of the customer, present, and future." Crosby: "Conformance to requirement" Taguchi: "The loss impart to the society from the time a product is shipped." ISO 9000:2000: “The degree to which a set of inherent characteristics fulfills requirements."

The ISO standard defines quality rather widely because it involves more than just a product; it also includes processes, organization, responsibilities, work instructions and resources. (Hoyle, 2007). QMS can be defined as “the managing structure, responsibilities, procedures, processes and management resources to implement the principles and action lines needed to achieve the quality objectives of an organization” PohNgohKiew et al. (2016). Implementing the quality management system is a strategic decision of the organization. The needs, objectives, products, used processes and structure and size of the organization affect the planning of the quality management system. The objective of international standards is not to have a uniform structure or homologous documentation. Rather the standard’s requirements are set to fulfill the product’s requirements (SFS-EN ISO 9001, 2008). ISO 9001 or quality management certification is a standard that sets out the requirements that are generic and are intended to be applicable to all organizations, regardless of their type, size and product provided for quality management system, technical committee of ISO which is TC-176 formulates all the standards of ISO 9001 (khattak and Arshad, 2015).

Nowadays different megatrends driving growth are closely linked to industry sectors including construction, energy efficiency and housing areas in which plastics are playing an

ever-increasing role (Industry over view, the plastic industry in Germany issue 2016/2017). Plastic can be described as materials that consist of polymers which contain a long chain of carbon and other chemical elements such as Hydrogen, Nitrogen, Oxygen and Chlorine and so on. In that sense, plastic is a specific subset of Polymers (Pintu MD. Nazmul Hossain, 2016). In Modern age, plastic is one of the great miracle materials. It is playing a very important role in this era. In fact, plastic has made possible to take aeronautics technology to further forwarded giant steps over past 60 years including the advancements in satellites, aircraft, shuttles, missiles and so on. It now a day plays an important role not only in the earth but also for the space exploration. Moreover, plastics are benefitting the constructions works, electronics, the transportation, the packaging and the industries, actually everywhere in our daily life (Pintu MD. Nazmul Hossain, 2016).

2.2. History of ISO 9000 (Quality management concept)

The quality management system developed by the international organization for standardization is highly related to early military systems. ISO 9000 can be traced back to the military standards developed by the US Military, the NATO, and the British military in the 1930's (Hallström, 2000 cited by Sandström and Svanberg, 2011). It dates back to world war two. Before the war, it was customary for military authorities to inspect large military projects such as the building of war ships. With the increased demand for these ships in world war two, the ships had to be produced faster by building them in pieces first and then putting the pieces together at alter stage. These pieces had to be measured and controlled by military authorities; therefore the allied forced developed the first military specifications (van Bruggen et al., 2002 cited by Manders 2015).

After world war two, attention to organization's quality was added to the standards apart from product requirements and "MIL-Q9858" was introduced. This was the forerunner of "AQAPs" Allied Quality Assurance Publications. At a certain moment in time the NATO partners agreed for economic reasons that when they place an order from a member country, military authorities in that member country could supervise the production. The path to certification was created. In 1963, the first AQAP which provided requirements for contractual suppliers' organizations came into existence. When a company wanted to do business with the military, the organization's quality was first checked by a group of military staff. If the company in question met all the requirements, it received the AQAP certificate. This became a requisite for doing business with the military. It did not take long for civil bodies, certification organizations, to take over the inspection activities (van Bruggen et al., 2002 cited by Manders 2015). Because of the positive experience with this quality assurance in military production, the civil side got interested in it: Why not apply the same approach in business-to-business environments? Standards were necessary for assuring quality; therefore some countries developed quality assurance standards based on the military AQAPs. Because of the continuous increase in cross border trade, the necessity to have an internationally accepted set of criteria increased. This resulted in the ISO 9000 standards (van Bruggen et al., 2002 cited by Manders 2015).

2.3. ISO 9000 standard family

ISO 9000 is a series of quality management systems (QMS) standards created by the international organization for standardization, a federation of 132 national standards bodies. The ISO 9000 QMS standards are not specific to products or services but apply to the processes that create them. The standards are generic in nature so that they can be used by manufacturing and

service industries anywhere in the world. ISO (technical committee ISO/TC 176) has been published five editions for ISO 9000 certification. The ISO 9000:1987 was included three standards for quality assurance: ISO 9001, ISO 9002, and ISO 9003 for being a model for quality assurance in only final inspection and testing. The first version of QMS standard or ISO 9000:1994 emphasized quality assurance via preventive actions added. ISO 9001:2000 was integrated ISO 9001, 9002 and 9003 into one standard or ISO 9001 and making a new standard, its main aim was to shift from quality assurance to quality management (UNIDO, 2012).

Accordingly, it made a radical change in thinking based on process approach, structure (8 clauses), and customer satisfaction. The fourth version was published in Nov. 2008 with minimal changes made from the 2000 version but greater emphasis on customer focus and satisfaction (ISO, 2010). The main purpose of ISO 9001:2008 is to clarify existing requirements and to improve the consistency of approach with other management standards like EMSs. Recently, ISO 9001:2015 (5th ed.) was published in Sep. 2015. The latest edition is generated a radical change in thinking based on the identification of risk and risk control, a structure with 10 clauses. Furthermore, this version can be integrated much better with other management standards (ISO, 2015d).

- ISO 9000: Quality management systems, fundamentals and vocabulary;
- ISO 9001: Quality management systems, requirements;
- ISO 9004: Managing for the sustained success of an organization, a quality management approach, and;
- ISO 19011: Guidance for internal and external audits of quality management systems.

Two of the most important objectives in the revision of the ISO 9000 series of standards have been: (www.iso.org/tc176/sc02/public). To develop a simplified set of standards that will be equally applicable to small as well as medium and large organizations and for the amount and detail of documentation required to be more relevant to the desired results of the organization's process activities. It is stressed that ISO 9001 requires (and always has required) a documented quality management system and not a system of documents. The term documented information was introduced as part of the common high level structure (HLS) and common terms for management system standards (MSS) (www.iso.org/tc176/sc02/public). ISO 9001:2015 allows organization flexibility in the way it chooses to document its quality management system (QMS). This enables each individual organization to determine the correct amount of documented information needed in order to demonstrate the effective planning, operation and control of its processes and the implementation and continual improvement of the effectiveness of its QMS (www.iso.org/tc176/sc02/public).

The process approach in ISO 9001:2008 incorporates the PDCA cycle and preventive action based under the identification and elimination of the root causes of the problems (e.g. errors, defects, lack of adequate process controls) (ISO, 2008), whereas ISO 9001:2015 incorporates the PDCA cycle and risk-based thinking (ISO, 2015d). Consequently, the main changes within the ISO 9001:2015 in comparison with ISO 9001:2008 are as follows (IAF, 2015): Furthermore, ISO 9001:2008 and 2015 have approximately the same requirements; The adoption of the HLS, An explicit requirement for risk-based thinking to understand better process approach, Less emphasis on documents, and fewer prescribed requirements, Increased emphasis on organizational context (Environment), Increased leadership requirements, Greater emphasis on achieving desired outcomes to improve customer satisfaction.

The motivation of top management, process approach and continual improvement can be named as examples of practical actions in improving the performance of a company´s organization. The three new concepts are described in the official ISO publication the process approach in ISO 9001:2015 as the following: Risk-based thinking, PDCA, The Process Approach. The paper explains that these three concepts together form an integral part of the ISO 9001:2015 standards. Risks that may impact on objectives and results must be addressed by the management system" (The Process Approach in ISO 9001:2015, p. 1).

2.4. The seven quality management principles

The ISO standard has defined principles that top management should take into consideration when pursuing better performance. One of the definitions of a principle is that it is a basic belief, theory or rule that has a major influence on the way in which something is done. Quality management principles are a set of fundamental beliefs, norms, rules and values that are accepted as true and can be used as a basis for quality management (© ISO, 2015). The QMPs can be used as a foundation to guide an organization's performance improvement. They were developed and updated by international experts of ISO/TC 176, which is responsible for developing and maintaining ISO's quality management standards (© ISO, 2015). These principles are not listed in priority order. The relative importance of each principle will vary from organization to organization and can be expected to change over time (© ISO, 2015).

- ✓ **Customer focus.** Meeting and exceeding customer needs is the primary focus of quality management and will contribute to the long term success of your enterprise. It is important to not only attract but also maintain the confidence of your customers, so adapting to their future needs key.

- ✓ **Leadership.** Having a unified direction or mission that comes from strong leadership is essential to ensure that everyone in the organization understands what you are trying to achieve.
- ✓ **Engagement of people.** Creating value for your customers will be easier if you have competent, empowered and engaged people at all levels of your business or organization.
- ✓ **Process approach.** Understanding activities as processes that link together and function as a system helps achieve more consistent and predictable results. People, teams and processes do not exist in a vacuum and ensuring everyone is familiar with the organization's activities and how they fit together will ultimately improve efficiency.
- ✓ **Improvement.** Successful organizations have an ongoing focus on improvement. Reacting to changes in the internal and external environment is necessary if you want to continue to deliver value for your customers. This is of paramount importance today when conditions evolve so quickly.
- ✓ **Evidence based decision making.** Making decisions is never easy and naturally involves a degree of uncertainty, but ensuring your decisions are based on the analysis and evaluation of data is more likely to produce the desired result.
- ✓ **Relationship management.** Today's businesses and organizations do not work in a vacuum. Identifying the important relationships you have with interested parties such as your suppliers and setting out a plan to manage them will drive sustained success.

2.5. Quality management system tools

To find ways to improve QMS processes, first have data to understand how those processes are performing. Analyzing this data will, first of all, presents with areas that can be improved, and secondly, ongoing data collection will show that improvement has actually

happened after take the necessary actions. There are vital quality control tools to present data in an understandable way so that it can be analyzed for improvement; Data tables, Pareto analysis, Scatter diagrams, Trend analysis, Histograms, Control charts, Cause and effect analysis.

2.5.1. PDCA cycle

The PDCA or Plan-Do-Check-Act- methodology as shown below, serves as a tool for managing processes and systems by promoting the adaptation of a process approach when developing, implementing and improving the effectiveness of a quality management system. The main goal being enhancing customer satisfaction by meeting customer requirements (SFS-EN ISO 9001, p. 11). It is a simple yet powerful tool and can be applied to almost any process. It is defined in the above mentioned as follows; Plan: set objectives of the system and processes to deliver results (what to do and how to do it). Do: implement and control what was planned. Check: monitor and measure processes and results against policies, objectives and requirements and report results. Act: takes actions to improve the performance of processes.

The clauses and requirements of the standard are all based on the Plan – Do – Check – Act (PDCA) cycle. PDCA is integral and operates at the process level and at an overall system level (National Security Inspectorate, 2016). Plan: -clause 4: context of the organization, Clause 5: leadership, Clause 6: planning, Clause 7: support, Do: - clause 8: operation, Check: - clause 9: performance evaluation, Act: - clause 10: improvement.

The figure shows the continuous improvement method showing the relationship and importance of the customer.

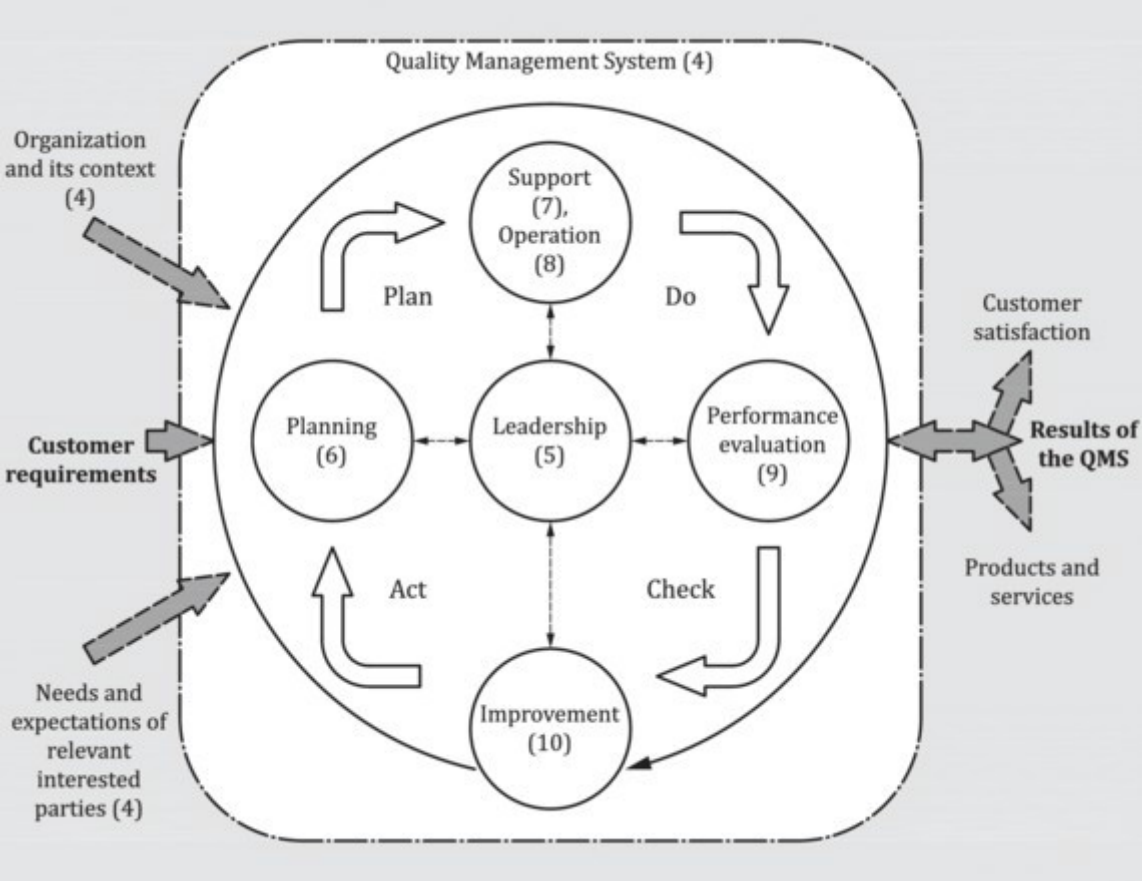

Fig 2.1 Representation of the structure on international standard in PDCA cycle of QMS for ISO 9001:2015

2.5.2. Process approach

Process Approach is defined by the SFS-EN ISO 9001 standard (p. 9) in the following way: The application of a system of processes within an organization, together with the identification and interactions of these processes, and their management to produce the desired outcome, can be referred to as the Process Approach. When this is typed in common language and in as practical manner as possible, the definition could be something like: all organizations have processes which can be defined, measured and improved. Processes have an interaction

with each other and culminate in producing results according to the goals set by the organization. According to Lecklin (”Quality as a success factor of the company”, p. 137) the process approach can be shown as a simple and easy to understand form, as an illustration of several inter connected links in a chain, in which Input becomes Output.

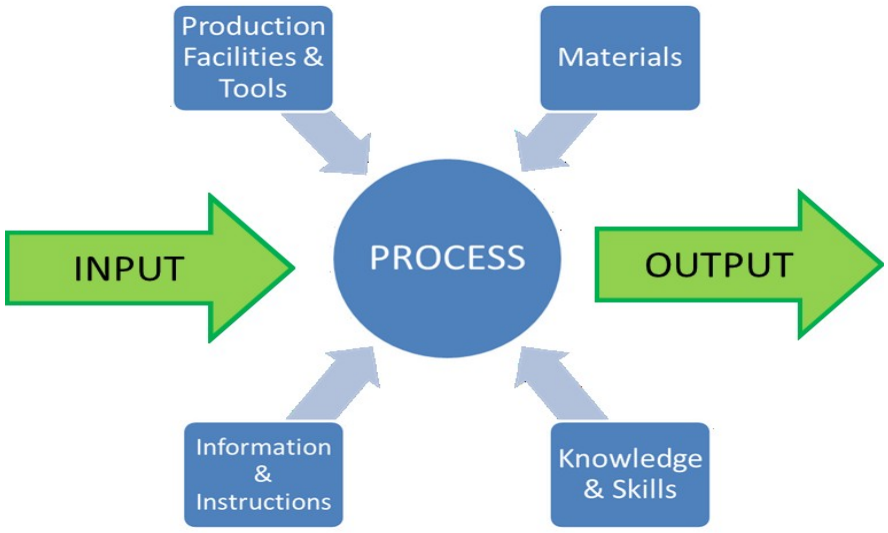

Fig 2.2 Business process, simplified (adapted from Lecklin, Figure 4.1, p. 137).

2.5.3. Fishbone tool for root cause analysis

Fishbone diagram is a method used to determine the global risk of an event with multiple relevant causes, relatively easy to apply (Ilie G. and. Ciocoiu C.N. Vol. 2 Issue 1 (2010) p: 1-20).

Fishbone (Ishikawa) diagram mainly represents a model of suggestive presentation for the correlations between an event (effect) and its multiple happening causes. The structure provided by the diagram helps team members think in a very systematic way. Some of the benefits of constructing a fishbone diagram are that it helps determine the root causes of a problem or quality characteristic using a structured approach, encourages group participation and

utilizes group knowledge of the process, identifies areas where data should be collected for further study (Basic Tools for Process Improvement, 2009).

The fishbone diagram (also called the ishikawa diagram) is a tool for identifying the root causes of quality problems. It was named after Kaoru Ishikawa, a Japanese quality control statistician, the man who pioneered the use of this chart in the 1960's (Juran, M., and Godfrey, A, 1999). Manufacturing is currently being used as a continuous quality improvement tool, providing a planning, implementing, monitoring and evaluating framework for the quality improvement measures on a sustainable basis (Masoud Hekmatpanah, 2011).

A cause and effect diagram often called a “fishbone” diagram can help in brainstorming to identify possible causes of a problem and in sorting ideas into useful categories. A fishbone diagram is a visual way to look at cause and effect. It is a more structured approach than some other tools available for brainstorming causes of a problem (e.g., the Five Whys tool). The problem or effect is displayed at the head or mouth of the fish. Possible contributing causes are listed on the smaller bones under various cause categories. A fishbone diagram can be helpful in identifying possible causes for a problem that might not otherwise be considered by directing the team to look at the categories and think of alternative causes. Include team members who have personal knowledge of the processes and systems involved in the problem or event to be investigated (https://www.cms.gov/medicare/provider-enrollment-and).

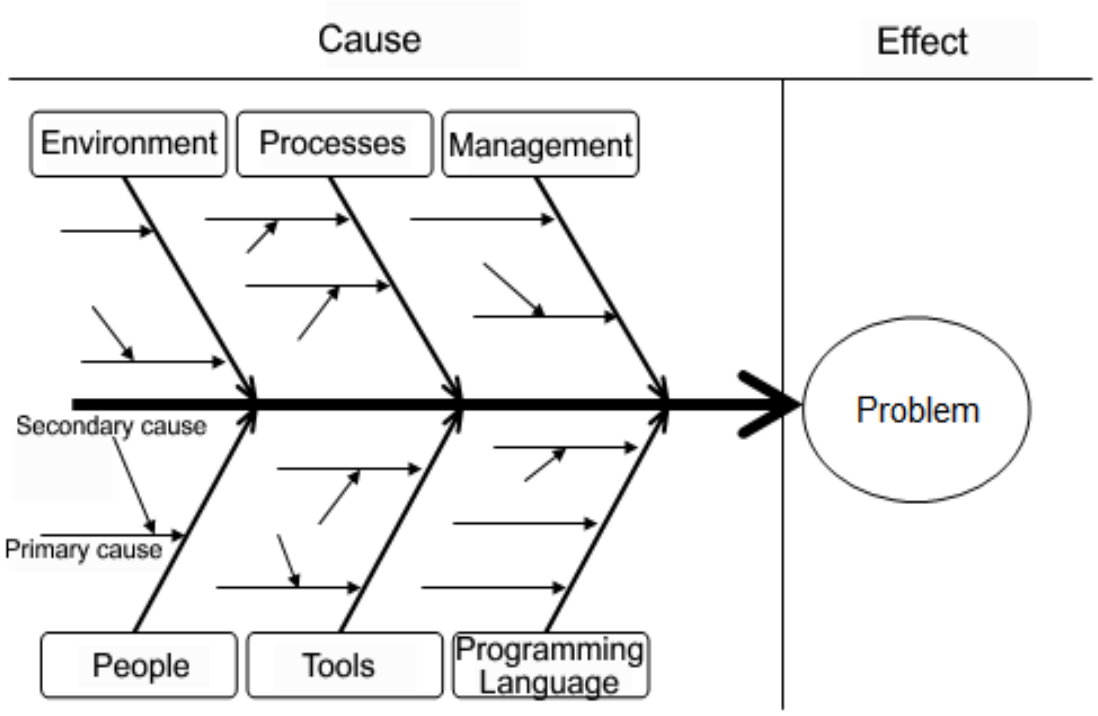

Fig 2.3 Example of fishbone cause and effect diagram; source: (https://commons.wikimedia.org/w/index.php?curid=6444290 (by Fabian Lange)

2.6. ISO 9001:2015 standards structure

ISO 9001:2015 (the most new version of the standard) is made up of a number of different sections, each concentrating on the requirements involved in different aspects of a quality management system (ISO 9001:2015).

Clause 1- Scope: It introduces the requirements of a quality management system which supports the delivery of a product or service, through the application of effective and continually improving systems, assuring conformity to customer and applicable legal requirements, whilst enhancing customer satisfaction. Clause 2- Normative references: ISO 9000:2015, Quality

management systems fundamentals and vocabulary is normatively referenced within ISO 9001:2015. Clause 3- Terms and definitions: This clause simply references back to ISO 9000:2015.

Clause 4- Context of the organization: This clause sets out the requirements for an organization to take a high level overview of the business, considering the key internal and external factors which impact it, and how it should respond in the form of a defined management system, understanding the organization and its context, understanding the needs and expectations of interested parties, determining the scope of the quality management system and quality management system and its processes.

Clause 5- Leadership: This clause includes a good proportion of content which will be familiar from ISO 9001:2008 but also introduces some significant changes on overall leadership and commitment and the expectations for top management to engage more fully with the critical aspects of the quality management system, leadership and commitment, policy, organizational roles, responsibilities and authorities.

Clause 6- Planning: This clause is an excellent addition to ISO 9001:2015, introducing the concept of risk (and opportunity) via the HLS. And the clause focuses on actions to address risks and opportunities, Quality objectives and planning to achieve them and planning of changes in the organization.

Clause 7- Support: An effective quality management system cannot be maintained or improved without adequate resources. As a function of planning, such resources should be

determined and provided. This includes contract or project specific resources. This clause gathers together in one place all the areas relating to the “people, place and procedural” aspects of the management systems. The basic HLS clauses cover the following; resource, competence, awareness, communication and documented information.

Clause 8 – Operation: This clause basically represents the production and operational control parts of the standard, the ‘engine house’ of production. There are a significant number of clauses added to the basic HLS. Operational planning and control, requirements for products and services, design and development of products and services, control of externally provided processes, products and services, production and service provision, release of products and services and control of nonconforming outputs.

Clause 9 - Performance evaluation: Monitoring, measurement, analysis and evaluation, collection and analysis of relevant data is necessary to measure the suitability and effectiveness of the management system and to identify opportunities for improvement. Business goals and objectives should considered when deciding what to analyze and comment. Internal audit and management reviews are mandatory.

Clause 10 – Improvement: This clause provides an overview of what improvement means in the context of ISO 9001:2015 - an overall approach requiring review of processes, products and services and quality management system results, with some useful reminders that the mechanisms for such improvements can be achieved by a variety of means; correction, corrective action, continual improvement, breakthrough change, innovation and reorganization. Nonconformity and corrective action are basic for continual improvement

2.7. ISO 9001 (Quality management systems requirements)

The most successful standard still published by ISO. The standard specifies requirements for the quality management system where an organization needs to demonstrate its ability to consistently provide products (including services) that meet customer and applicable statutory and regulatory requirements, thereby enhancing customer satisfaction. Measurements of customer satisfaction are used as feedback to evaluate and validate whether customer requirements have been achieved. The management review will then provide feedback to top management for change authorization and improvement opportunities (IS / ISO 9001: 2008).

ISO 9001:2015 clause 4.4 Quality management systems and its processes requires an organization to "maintain documented information to the extent necessary to support the operation of processes and retain documented information to the extent necessary to have confident that the processes are being carried out as planned." (www.iso.org/tc176/sc02/public)

The 2015 revision of the standard become more liberal regarding documentation requirements, meaning that there are no longer six mandatory procedures as in the previous 2008 version of the standard. ISO 9001 also identifies many records that need to be maintained, which are generated by the processes of the quality management system (©2015 9001 Academy, 2015). Scope of the quality management system, Quality policy, Quality objectives and plans for achieving them, Procedure for control of externally provided processes, products and services (outsourced processes), are mandatory documents.

2.8. Problems while implementing quality management system

There is a relationship between the values and requirements that ISO 9001 standard and the organizational structure and management orientation. Control oriented organizations get

benefits from the ISO 9001 quality system more easily than creativity oriented organizations. The impact of the standard on organizational performance is greatest in organizations. Which mainly utilize explicit knowledge and is the weakest in organizations, which mainly utilized tacit knowledge (Adolfas Kaziliünas, 2012). There is an interesting relationship between the reasons of ISO 9001 quality management system implementation and the corresponding performance outcomes. Organizations maximize their benefits if they achieve ISO 9001 quality system implementation based on internal motivation. Organizations that pursue ISO 9001 quality management system implementation willingly and positively across a broad spread of objectives are more likely to report improved organization performance than those organizations that are pursuing ISO 9000 certification in a reactionary mode due to customer pressure (Adolfas Kaziliünas, 2012).

In order to achieve the true value associated with quality system implementation, it should be made consistent with the organizations strategic directions. Also, identified barriers should be reduced or eliminated in order to have effective implementation which in turn will result in the expected outcome over time. Also, enhancing the level of true value of the standard and effective implementation, it is strongly recommended that organizations need to focus on receiving training by professional organizations/institutions on the true meaning of the standard and the new changes and how these changes can affect the organization (Magd, 2008).

2.8.1. Impact of knowledge orientation

ISO 9000 has become a favored system for money organizations embarking on quality management. ISO 9000:2000 is an information sharing tool that an organization can use to gain the knowledge needed to enhance quality and performance. It also provides a ready framework for ordering and structuring organizations knowledge. Successful implementation of a quality

management system requires appropriate program formulation (Addey, 2001; Chemadds, 2003). The program related to quality management system implementation should consider the early stages of its life cycle the right activities, in the right order and with the right resource involvement. In this context, Lin and Wu (2005) identified the most important activities within ISO 9001:2000 that an organization can use to gain knowledge needed to enhance quality and performance. It also provides a ready frame work for ordering and structuring organizations knowledge.

2.8.2. Organizations certification motivation and the corresponding results

The majority of organizations implement the ISO 9001:2008 quality system for several reasons. Firstly it can be seen as a means of improving internal processes and product or service quality. Secondly, it can be driven by the adopting organization as a means or a route of increasing a local or a foreign market share where ISO certification has value. Thirdly, it may be driven by customers request to conform to their internal quality control and supplier quality assurance system (white et. al.2009). Organizations that view certification as an opportunity to improve internal processes and systems, rather than simply to hang a certificate on the wall, will get broader positive results from the ISO 9000 quality management system (Lopis and Tari, 2003). Swedish investigators Lundmark and Westelius (2006) revealed that the strongest most obvious and most valued effects of the ISO 9000 quality management system are cleared and more apparent work procedures and responsibilities. The most apparent problem is bureaucracy, which can lead to reduced flexibility.

The benefits from the ISO 9001 quality system can be classified into external and internal categories. The former are related to improvements in terms of marketing and promotional aspects, customer satisfaction and market share, while the internal benefits are related to

organizational improvements, the reward system, team work, measurement of performance and communication, and continuous improvement (Douglas et al., 2003; Gotzamani and Tsiotras, 2002).

2.8.3. Influence of maintenance of the quality system after its implementation

This period is important if the organization wants to continuously improve and reap long term benefits from having a quality management system in place (Nanda, 2009). There is evidence in literature that the ISO 9001 perceived benefits of quality management systems decrease overtime (Casadesus and Karapetrovic, 2005). They stated that there was no evidence to state that certified organizations progressively experience more beneficial outcomes from ISO 9001 certification. In fact results indicated that quite the opposite organizations appeared to experience declining benefits over time. Those investigations show how important correct maintenance of the quality management system during the post certification period is. During this period, emphasis is placed on activities such as management reviews, corrective and preventive actions, internal and external audits, collection and analysis of data, measurement of performance, and continuous improvement. Ab Wahid and corner (2009) investigated critical success factors and problems with ISO 9000 quality management systems maintenance in a service organization. Results showed that people in top management, other employees, the reward system, team work, continuous improvement, understanding of ISO 9000 itself and measurement of performance and communication are all critical success factors for ISO 9000 maintenance and for successful outcomes of the quality management system. Continuous improvement of processes, people and systems are also very important factors for sustainability of the quality management system. It is useful to apply other methods and tools to achieve required quality. Miguel and Dias (2009) proposed the framework for combining the ISO 9001

requirements with quality function development. White et al. (2009) suggested using process mapping for process analysis and development in not-for-profit organization.

2.9. Empirical studies

Hesham and Magd (2007) conducted an empirical study on a sample of industrial companies in Egypt. The purpose of their study was to evaluate ISO 9001:2000 implementations in Egypt by identifying the critical success factors contributing to the success of the standards. Furthermore, the authors identified the problems associated with ISO implementation. The authors reported that management commitment was found to be an important factor contributing to the success implementation of ISO 9001, while the need to change the existing system to fit ISO 9001 and workers resistance to implement the standards were viewed as the most important problems facing the Egyptian manufacturing companies.

Jamal and Theuri (2015) conclude that the implementation progress should be monitored to ensure that the quality management system is effective and conforms to the standard. These activities include internal quality audit and management review. However, successful implementation of ISO 9001 in organization can be mysterious. One of the key reasons for this is that many organizations overlook the complexity of the implementation processes and the organizational changes that are needed to ensure the QMS is fully functional.

Daniel (2010) the benefits gained by implementing ISO 9001 QMS in the effort corporate organizations were improved process and procedures, improved awareness of employees for quality, provision of better customer service. Even though more than a million organizations have been certified to ISO QMS 9001 standard till date, and also despite the huge number of research findings revealing the perceived benefits of implementing QMS, there were certain common problems faced by majority of these certified organizations, which influenced their

business performance by meeting Kumar and Balakrishnan (2011) and summarized these problems broadly as: Leadership related issues (Inadequate Commitment by top management), Lack of motivation, Recognition, Organizational learning, strategic planning and long term focus, Strategy related issues (Mission, Vision, Values, Strategic Planning, Strategy Mapping), Quality System related issues (Weak PDCA cycle, generic system, internal audit not in depth, non value adding meetings/trainings and excessive paperwork), Society oriented gaps (Corporate Social Responsibility, Environmental Management and Sustainability).

Overall, the review so far is believed to be important input for the proposed study and the above researchers agreed on the following issues: quality has become so important that the world is uniting around a single quality standard. ISO 9000 ISO 9000 is a family of standards which relate to QMS and are designed to assist organizations in meeting their customers' and stakeholders' needs with regard to quality product through the implementation of this management system.

2.10. Research Gaps

Regardless of studies tried to elaborate various issues that are rotated around ISO 9001 QMS implementation. The following research gaps are identified.

i. One of the gaps in the previous study related to QMS does not consider the reason beyond need/want of implementing QMS in their respected firms.

ii. Majority of the study focused on the specific issue like problems or barriers or benefit or importance of QMS implementation in the organizations. Beyond from this point, they did not investigate the overall effect of implementing QMS in the organization and its practices in the respected organization.

iii. Researchers are done widely in the rest of the world related to QMS in different sector. However, there are few studies has been conducted in Ethiopia particularly in QMS on plastic product manufacturing industries. Due to this, the researcher is interested to investigate all the issues related to QMS implementation and practice holistically to get a full picture on the gap and potential of firms in implementation QMS by fulfilling research gaps.

2.11. Conceptual frame work of the study

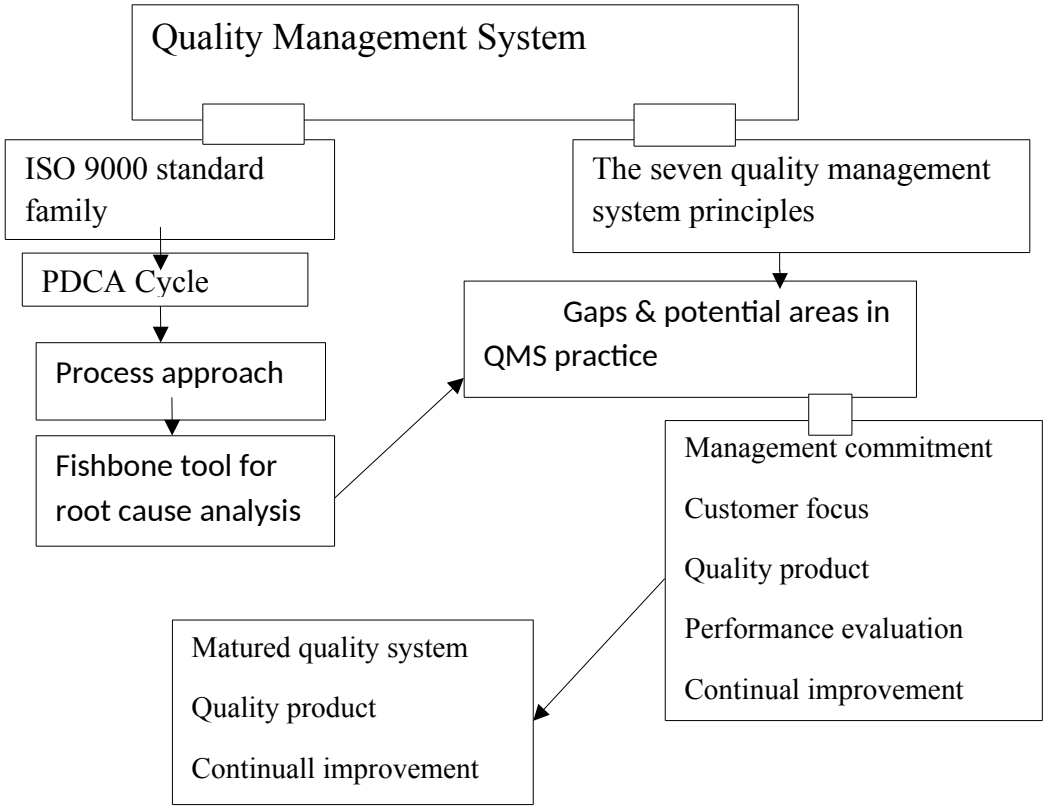

Fig 2.4: Conceptual fame work of the study (Source, own formulation)

As indicated in the diagram of the conceptual frame work, the study is highly focused on the extent of practices of the above main QMS requirements, tools and principles.

CHAPTER THREE

RESEARCH DESIGNS AND METHODS

3.1. Research design

Since the main objective of the study is to assess the QMS practice gaps in plastic manufacturing firms and related production quality challenges, the proposed study working a descriptive type of research design. So the study was combine both qualitative and quantitative research approaches, and this is considered to be efficient for answering the research questions.

3.2. Research approach

Several research approaches can be adopted to conduct a research study. A combination of qualitative and quantitative approaches can build on the strengths and minimize the weaknesses of both (Dahlan, 2009). This study therefore implemented mixed approaches in a simultaneous manner to broaden, deepen, to build and to increase internal and external validity and findings of the research. Concurrent procedures were in which the researcher converges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem.

3.3. Population

In Ethiopian including the medium and large plastic manufacturing firms there are about 580 plastic industries (F.D.R.E Chemical and construction inputs industry development institute report, 2018). From those industries the research focus the firm which is certified the ISO QMS only. In Ethiopia there are three QMS certified bodies, there are; Ethiopian conformity assessment enterprise, alcumus ISOQAR and DQS Ethiopia. According to Ethiopian conformity assessment enterprise there are six QMS certified plastic product manufacturing firms. From those firms five of it in Addis Ababa. From alcumus ISOQAR there are eight QMS certified plastic product manufacturing firms. From those firms three of them located in Addis Ababa. From DQS Ethiopia two plastic manufacturing firms are certified, both are located in Addis Ababa. So that the research focuses on those QMS certified ten firms which are located in Addis Ababa.

Table 3.1 QMS certified plastic product manufacturing firms in Ethiopia

ISO QMS certified plastic product manufacturing firms	Location

Ethiopia plastic engineering industry	Addis Ababa
Family Modern Plastic Factory	Alemgena
Oromiya Pipe Factory PLC	Addis Ababa
Maruti Plastic Industry	Addis Ababa
Concord Industrial and Business PLC	Alemgena
Awash Melkassa Aluminium Sulphate & Sulfuric Acid	Adama
Capital Business PLC	Sebeta
AG Pipe Fitting Technology PLC	Bhir Dar
Minaye Packaging PLC	Addis Ababa
Excel Plastic PLC	Addis Ababa
Ethiopolymers PLC	Addis Ababa
Roha Packaging PLC	Addis Ababa
Maruti Plastic Industry	Addis Ababa
Tekrariwa Plastic Poducts	Addis Ababa
Bruh Tesfa Irrigation & Water Technology PLC	Tigray Mekle
Horizon Addis Tyres S.C	Addis Ababa

Field survey 2018

Table 3.2 Size of population

ISO QMS certified plastic product manufacturing firms	No of employees
Ethiopia plastic engineering industry	95
Excel plastic PLC	53
Ethiopolymers U-PVC & PVC plastic PLC	51
Roha packaging PLC	62

Total	261

Filed survey 2018

3.3.1. Sampling technique

From ISO quality management system certified plastic firms; the study does cover 4 firms by using simple random sampling from 10 QMS certified firms located in Addis Ababa, that is 40%. According to Mugenda, O. M. & Mugenda, A. G. (2003). 30% and above sample from the population is adequate. However, the respondents that represent the firms are selected using purposive sampling; from each firm and to all departments; quality, production, marketing, finance, purchasing, and maintenance. Those working as a head or supervisor for the above departments are selected since they are well aware of QMS practices and easily they observe the related gaps and its improvement through the firm.

3.3.2. Sample size determination

From 16 available plastic products manufacturing firms which are ISO QMS certified in the country, a total of 10 firms are sited in Addis Ababa. From this target population, four (40% of 10) was selected as mentioned in the above procedure. It constituted 261 employees from the selected four certified firms. In order to get reliable and additional information it is better to discuss face to face with managers in relation gaps, potential areas of QMS implementation. Hence, managers were appropriate to elaborate a qualitative aspect.

The total departments of the selected firm's employee were 261 and the sample size of 92 respondents; from Ethiopia plastic engineering industry 32 respondents purpesively selected and from Excel plastic PLC, Ethiopolymers U-PVC & PVC plastic PLC, Roha packaging PLC, 20

respondents respectively were selected purpesively based on the criterions suggested by Carvalho of sampling procedure. The sampling criterions are listed in the below table, table 3.3. (Carvalho, 1984)

Table 3.3 Sample Size Selection, (Carvalho, 1984)

Population	Low	Medium	High
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1200	32	80	125
1201-3200	50	125	200
3201-10000	80	200	315
10001-35000	125	315	500
35001-45000	200	500	800

3.4. Sources of data and collection techniques

The critical focus of any research determines the nature and source of the data to be collected and vice versa. Moreover, the nature and source of data urge researchers which research method to use (H. Crandall & R. Busselle, 2009). Since there are two types of data sources; primary and secondary. Primary data are collected by the researcher from the firms and not from publications specifically for the research problem at hand. According to D. Mercieca et al., (2013), such data can be directly collected by the researcher or can be referred from the

firm's information system. Whereas, secondary data includes information which was already published and is collected for a purpose other than the specific research needs under investigation (P. Smeyers, 2008; H. Crandall & R. Busselle, 2009). This study used both primary and secondary data collection methods to achieve its objective.

For a primary data collection method, structured questionnaire was used. The questionnaire dispatched to 92 purposively selected employees from the selected firms. Purposive selection has helped to insure the reliability of the data. And also using the questionnaire can help the researcher/s to collect data faster and cheaper than any other instrument.

The secondary data used in this study was gathered from the different materials written by different authors in relation to this topic. Other secondary information was gathered from different websites and different journals about the study.

3.5. Measurement and instrumentation

The data was analyzed based on descriptive statistics, the designed questionnaire can let the respondents give their responses corresponding their personal experiences and opinions to the different variables by point Likert scale (e.g. a scale from 1 to 5, strongly disagreement= 1, to strongly agreement= 5). Likert scales are proper and widely used in opinion measurement with scale ranging. In this study, the investigation questionnaire was divided into two main parts: Part I is related to the general information (demographic characteristics) of the respondents. Part II was focus on the evaluation of the effectiveness of QMS practice in plastic ISO certified firms located in Addis Ababa. The questions asked were closed-ended questions with a five point

Likert rating scale. Furthermore, the questionnaires were personally distribute and retrieved by the researcher to target respondents. The completed questionnaires are collected from them. Also, the confidentiality and secrecy of the participants were protected, for this matter, their names were not required on the questionnaires. Regular cross checking and followups had also made at the time of data collection to ensure accuracy, relevance, completeness, consistency, and uniformity of the data.

3.6. Method of data analysis used

The study collected both qualitative and quantitative data, and therefore, data were analyzed according to its type. Mean and the standard deviation was calculated to show the respondent firms experience and percentages were considered to present the respective challenges. Generally, data presentation and interpretation were made using tables in order to display the collected data in a summarizing and meaningful way. The data were finally interpreted based on statistical findings.

3.7. Validity and reliability

3.7.1. Validity

Regarding to validity, validation of questionnaires item was carried out through initial consultation of experts to judge the research instrument. The researcher will use construct validity, because of more accurate and meaningful results and extent to which a measure adequate represents the underling construct that it is supposed to measure and ensure that the information which is requesting from the respondent covers all relevant areas and the objectives of the research (Bhattacherjee, 2012). To increase the validity of the data collected using

questionnaires and interview the researcher look for the data based on the objectives of the research. In addition, a pilot study was undertaken to enrich the validity of the questionnaire. So, a preliminary test was undertaken with three department heads in my colleagues and for final wording and sentence checking given to my advisor. The final version of the questionnaire was then piloted on one plastic firm that is sited in Addis Ababa. Their feedback regarding their comprehension of the questionnaire was respected.

3.7.2. Reliability

The item analysis was conducted for statements in the questionnaire that were summated into scores for the 5-factor categories. For each factor, Cronbach‟s coefficient α was calculated and a factor analysis specifying a one factor model was conducted. Cronbach‟s α value for all factor categories were > .70; this is adequate proof of internal consistency. Cronbach‟s α values of 0.50 to 0.70 are acceptable. The internal reliability test of the factors in each category was conducted by determining their Cronbach‟s coefficient α value.

3.8. Ethical consideration

The information was collected from firms were going to be kept confidentially in order to keep their ethical value. Institutional secured data like financial statements were not required for the analysis, and this in turn, encourage the firm representatives to freely respond to the items under study.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND DISCUSSION

4.1. Introduction

This chapter presented and analyzed the data gathered through questionnaires, interviews and from secondary sources that included websites and other research findings. The questionnaire was collected from employees of ISO 9001 QMS certified plastic firms that are sited in Addis Ababa. The interview was conducted with the managers and management members and also with the QMS certifying agencies.

4.2. Questionnaire & interview responded rate

From the total population of 10 plastic products manufacturing ISO 9001 QMS certified firms found in Addis Ababa, the study select four companies using simple random and distributed 92 questionnaires for four firms using purposive sampling methods. Out of 92 questionnaires, 78 questionnaires are filled and returned back properly. And the return rates of a questionnaire for this study become 86%. And also from four total managers of the firm; three of them were interviewed, which were 75% of the total managers of the sample.

4.3. Reliability analysis

Table 4.1 Reliability test

Variables	Cronbach's Alpha	N of Items
Top management commitment	0.825	6

Resource and communication	0.959	9
Quality product & customer focus	0.979	12
Performance evaluation	0.976	4
Continual improvement	.976	6
Over all reliability	.992	37

Filed survey 2018

4.4. Demographic characteristics of respondents

Four relevant demographic variables of the respondents were gathered as background information. These are gender, work department, level of education, and experience of the respondents. These characteristics of the respondents are presented as follows.

Table 4.2 Respondent of gender

Gender	Frequency	Percent(%)
Male	60	76.9
Female	18	23.1
Total	78	100

Filed survey 2018

From this one can easily understand that respondents with different background participated in all firms and majority of the respondent's males 60(76.2%) and the remaining 18(23.1%) are

females. From this, we can conclude that the lion share of the employee from sample organization is possessed by a male.

Table 4.3 Respondent education level

Educational background	Frequency	Percent(%)
Certificate	0	0
Diploma	6	7.7
BA/BSC	66	84.6
Above BA/BSC	6	7.7
Total	78	100

Filed survey 2018

Majority of the respondents 66(84.6%) are BA/BSC holders and next to above BA/BSC holders possess 6(7.7%) and diploma holders share the same percentage as above BA/BSC holders 6(7.7%).

Table 4.4 Respondent work experiences

Work experience	Frequency	Percent(%)
Less than a year	12	15.4

2-5	50	64.1
6-10	11	14.1
Above 10 year	5	6.4
Total	78	100

Filed survey 2018

As we have seen from figure 4.4, majority of the respondent 50 (64.1%) have work experience between 2-5 years, next to it those who have less than 1 year 12(15.4%) and those who have 6-10 years 11(14.1%) hold and those who have 10 years' experience have 5(6.4%).

Table 4.5 Respondent by the department

Department	Frequency	Percent(%)
Production department	12	15.4
Quality department	23	29.5
Marketing department	9	11.5
Finance department	10	12.8
Purchasing and Logistics department	1	1.3
Maintenance department	9	11.5

Other	14	17.9

Filed survey 2018

Table 4.5 tell us quality control respondents hold the first rank which is 23(29.5%), production 12(15.4%), marketing 9(11.5%), procurement and logistics 1(1.3%) and the rest finance 10(12.8%), maintenance 9(11.5%)and other departments like planning and research and development departments have 14(17.9%).

4.5. Descriptive analysis of gaps related to the QMS practice

In order to see the general perception of the respondents regarding the selected organization about the quality management systems practice in ISO QMS certified plastic firms, the researcher has summarized the measures with the respective means and standard deviations. Thus, the mean indicates to what extent the sample group averagely agrees or does not agree with the different statements. The lower the mean, the more the respondents disagree with the statements. The higher the mean, the more the respondents agree with the statement. On the other hand, standard deviation shows the variability of an observed response from a single sample, (Festinger. N, 2005).

4.5.1. Analysis of gaps related to top management commitment

Table 4.6 Descriptive analysis of top management commitment

Attributes	Mean	Std. Deviation
Top management identifies the product realization processes which can add values	2.58	1.099

Quality policy and quality objectives are established and communicated by the top management (putting as document, make banner & visible to all, discussion)	3.91	.706
The top management checked and reproved the availability of enough resources	3.96	.633
The top management avail trained human resources to meet the needs	3.92	.990
Consideration of customers' satisfaction in strategic planning of your company	3.77	1.289
Established open environment for all employees to participate in meeting the organizations goals	2.68	1.111

Filed survey 2018

TABLE 4.6 attribute 1 presented data with regards to the commitment of the top management on the identification of product realization processes which are value adding in their organizations which have a mean score of (*M*=2.58, *SD* = 1.099). This reflects the fact that top management does not take special efforts on product realization processes which can add values to demonstrate the required final product of any label of quality since the mean is below the clear-cut point (*M*<= 3). Even though the information that is gathered from interview analysis contradicts that majority of the general managers confirm that the efforts that are carried out by the top management to realize processes which are value adding are high.

Concerning attribute 2 with respect to the commitment of top management in establishing quality objectives and policy and communicating them have a score of (*M*= 3.91, *SD* = .70). From this, we can understand that top management of ISO QMS certified plastic firms put their

efforts in communicating the quality objective and policy for their respective organization employees.

The other important issue that was raised for the respondents was weather the top management is committed to checking and reproved the availability of enough resources or not. As illustrated in TABLE 4.6 attribute 3 scored (*M*= 3.96, *SD* = .63), this tells us the majority of the respondents are agree that the top management checked and reproved the availability of enough resources needed by the organization. In link with this; Dale *et al*., 2007 is a supportive study for this issue. However, checking and reproving the availability of enough resources take in account the organizational structure, procedures, processes and resources needed to implement quality management: such as buildings, equipment, IT systems, transport, skilled human resource etc (ISO 9001:2015 QMS requirement guidance document).

Attribute 4 TABLE 4.6 revealed that the majority of the response scored (*M*= 3.92, *SD* = .99) agreed that the top management the respected company avail trained human resources to meet the needs of the organization for the system.

In attribute 5 from the TABLE 4.6 about Consideration of customers' satisfaction in strategic planning of the company; and the majority of the respondents (*M*= 3.77, *SD* =1.28) agreed that the customer satisfaction is considered when the company planned its strategy. Concerning attributes 6, in established of an open environment to all employees to participate in meeting on the organization's goals near to have of the respondent agreed that the top management will not establish an open environment in participating of their employees which score (*M*=2.68, *SD*=1.11) The data clearly reflect that organizations are not established open

environment in which all employees can participate in meeting the organization's goals. Nayantara, 1989 also exhaust the lack of open environment. These are absence of trust integrity and honesty within and among the employees so that they do not resort to malpractices to achieve their objectives. However, during interview the managers' believed that there is an open environment for employees to reflect their opinion freely but during further investigation the options are minimum and narrow.

Management commitment is mandatory to ensure that the quality built in through the various processes is taken forward to all the levels and functions of the organization and maintained throughout. Providing adequate resources at the right time, to the right extent is an indication of the management commitment. Paying attention to the employees' issues, making the working environment friendly and comfortable, providing opportunities for growth (ISO 9001:2015 QMS requirement guidance document).

To sum up this theme, one can generalized that there is a positive outlook at large by the respondents and interviewees with respect to the top management commitment in various aspects as shown in TABLE 4.6. However, there are gaps in establishing open environment in which all employees can participate in meeting the organization's goals and top management not identifies the product realization processes which can add values in the firms.

4.5.2. Analysis of gaps related to resource and communication

Table 4.7 Descriptive analysis of gap related resource and communication

Attributes	Mean	Std. Deviation

Material (both equipment's and machinery) are available to cop up the quality management tasks (financial money, nonfinancial; laboratory instruments, modern technological machineries)	3.52	1.450
There are enough and qualified personnel in the company	4.35	1.195
There is adequate infrastructure for operation in your company (buildings, equipment, IT systems, transport,)	3.59	.906
There are adequate transportation/service/ for employee in your company	3.33	1.224
Does the company have an efficient process of Communication of the likes e-mail, memos, communication boards or any other	4.61	.838
Does the company properly set documents to be visible	3.97	1.217
You get adequate and updated information about your company	1.28	1.054
I am a part of the team, which manages process performance and evaluates the results	2.47	.785
I accept ownership and responsibility to solve problem	4.74	.659

Filed survey 2018

From TABLE 4.7 attribute 1, Majority of respondents are agreed with regards to provision of material (both equipment and machineries) in the firms to cop up the quality management tasks. (*M*= 3.52, *SD* =1.41). The interviewees also agreed on this response. But even if they gain enough money there is a problem in availing enough materials to cop up the quality management tasks due to the shortage of foreign currency in the country.

In relation to this; TABLE 4.7 attribute 2, Majority of the respondent similar to attribute 1, (*M*=4.35, *SD* =1.19) agree that the firm provide senough and qualified personnel in the respected organization to assist the system. Which is supported by Bhuiyan and Alams (2005) argue that, implementing ISO Standards does certainly require the involvement of several resources, especially human and financial resources. For attribute 3, majority of the respondent believes that the firms are providing adequate infrastructure for an operation that required by the system (*M*=3.59, *SD*=.906). Concerning the provision of adequate transportation/service/ for employee in the respected firms above average (*M*=3.33, *SD*=1.22) respondents agreed that companies are providing transportation service for their employees.

For attribute 5, the result revealed that majority of the respondents which is (*M*= 4.61, *SD*=.838) agreed that there is an effective & efficient process of Communication like e-mail, memos, communication boards or any other around in the organization. And also attribute 6 says, the majority of the respondent agreed that firms are properly set documents to be visible (*M*=3.97, *SD*=1.21). This shows that firms are prepared adequate and visible documents in which the system requires. Some of the main objectives of an organization's documented information are; communication of information, evidence of conformity, knowledge sharing and to disseminate and preserve the organization's experiences (www.iso.org/tc176/sc02/public).

Attribute 7, is about to get adequate and updated information about the firms and majority of the respondents (*M*=1.28, *SD*=1.054) are agreed that the firms do not provide adequate and updated information for their employees.

Concerning the participation in the process of performance and evaluates the results majority of the respondents (*M*=2.47, *SD* = .785) agreed that they do not involve in the team to participate for the process of performance evaluation. As explained in TABLE 4.7, attribute 9, the majority of the respondent (*M*=4.74, *SD*= .65) agree that they accept ownership and responsibility to solve problems in their respected organization. Most of the general managers that are participated in the interview period also acknowledge the sense of ownership and responsibility of their employees to solve problems. This implies that individuals' sense of ownership and responsibility to solve problems is positive.

In summary from this them, there is an encouraging effort that is done by the firms to realize the provision of resources even though they suffer by external factors that are related to foreign currency. And also they have enough and qualified human resource in the firm, which are also the potential areas of the firm. And also there is a potential area in adequate infrastructure for operation in your firm, adequate transportation/service/ for employees, an effective & efficient process of communication, the firm properly set documents to be visible and also employees acceptance ownership and responsibility to solve problems is excellence. But there is a gap in communication; getting adequate and updated information about the firm to employees and employees are not a part of the team, which manages process performance and evaluates the results.

4.5.3. Analysis of gaps related to quality production and customer satisfaction

Table 4.8 Analysis of gaps related to quality production and customer satisfaction

Attributes	Mean	Std. Deviation

The company have a procedure for evaluating suppliers	2.56	.880
The degree of communication of your company with its customers	3.07	.990
The extent of handling customer complaints quickly and positively	3.97	1.009
Customers' satisfaction with the quality of your products (customer compliments & number of repeat customers)	3.33	.966
Your company gives customer technical support (trainings, maintenance, information about the product)	2.63	.941
Jobs which are hazardous require more safety (dusts, cutters, chemicals)	1.73	1.258
The extent to which quality data are used as tools to manage quality	3.07	1.122
There is an adequate quality control system in the company (records, production follow-up, sample tasting periodically)	3.97	1.122
Degree of availability of proper inspection techniques for process & finished products	4.36	.946
Extent to which inspection, review or checking of work is automated	4.26	.993
Level of recognizing and solving quality related problems in the company (scrapping, supplying under concession, alternative uses, product rework or recall)	4.10	.918
All workers are responsible for the quality of products	2.69	1.279

Filed survey 2018

In the survey, the respondents were asked to evaluate the status related to firms procedure for evaluating supplier's; the majority of respondents (*M*= 2.56, *SD* =.88) agree that firms do not

have supplier evaluation procedures. This indicates that there is a gap in firms in the procedure to evaluate their suppliers.

Concerning attribute 2; the degree of communication firms with its customers above average respondents are agreed that (*M*= 3.07, *SD* =.99) companies are communicating in very well manner with its customers. These shows there are good communication with the customer but it needs a great effort. The findings that are elaborated during interview session also similar with the employees' response in all aspects of communication with the customer.

In the survey, the respondents were also asked about handling customer complaints quickly and positively. As mentioned in TABLE 4.8 attribute 3, the majority of the respondents (*M*= 3.97, *SD* =1.00) agreed that customer complaints are handled quickly and positively. This indicates that there is no gap handling customer complaints quickly and positively in the firms.

Concerning attribute 4; regarding customers' satisfaction with the quality of firms products, the survey revealed that majority of the respondents (*M*= 3.33, *SD* =.966) are agreed that customers are satisfied by the quality of products produced by firms. Customer satisfaction is measured by the following four indicators namely; customer compliments, number of repeat customers, customer retention rate and the level of customer satisfaction (Bruce, 2007).

In the above TABLE 4.8 attribute 5, regarding firm's customer technical support, the survey revealed that below average (*M*= 2.63, *SD* =.93) agreed that firms are not providing technical support for their customers.

According to TABLE 4.8, attribute 6, the majority of the respondents (*M*= 1.73, *SD* =1.25) agreed that companies do not give considerable attention for hazardous jobs to minimize the risk by exercising more safety. And concerning attribute 7, on the extent to which quality data are used as tools to manage quality above average respondents (*M* =3.07, *SD*=1.12) firms use quality data to monitor the quality of products. This shows that the quality data are appropriately used as required monitoring the quality of products, but it needs more effort.

In attribute 8 in TABLE 4.8 when respondents are asking about the availability of adequate quality control system in their respected firms majority of the respondent (*M*=3.97, *SD*= 1.12) agreed that adequate quality control system is established in their respected firms.

Concerning attributes 9; Majority of the respondents (*M*=4.36, *SD*=.946) agrees that there are enough proper inspection techniques for their process and finished products. This indicates that there are also adequate inspection techniques for process & finished products in the firm.

In related to the statement; the extent to which inspection, review or checking of work is automated, above average (*M*=4.26, *SD*=.993) agreed that the inspection process and checking of work are adequately implemented in their firms.

When we see the level of recognizing and solving quality related problems in the firms; the majority of the respondent (*M*=4.10, *SD*=.918) agreed that Level of recognizing and solving quality related problems in the firms are well exercised.

Concerning attribute 12 TABLE 4.8 near to half of the respondent (*M*=2.69, *SD*=1.27) are agreed that all workers are responsible for the quality of a product and the remaining half do not agree every worker are not responsible for the quality of products. This indicates that the quality issue in respected firms are not the concern of all employees.

To sum up this them; most respondent agree as there is a potential area in the firm in implementing the system, but there is also a gaps like where evaluating suppliers, less customer technical support, less safety for employees, less inspection, review or checking of work is automated, they indicates also the firm have less workers responsible for the quality of its products. Which clearly shows as less involvement of people and lack of continual improvement; So that the management should focus on this attributes in order to improve their product and to be used the system adequately.

4.5.4. Analysis of gaps related to performance evaluation

Table 4.9 Analysis of gaps related to performance evaluation

Attributes	Mean	Std. Deviation
Corrective actions are taken without the undue delay, to eliminate the causes of nonconformities in order to prevent recurrence	1.47	1.307
Adequate training are provided for the staffs based on the competency gap identified (QMS, internal audit, GMP trainings)	2.18	1.249
Does the frequency of training is good enough as identification of training needs & retraining if required.	1.92	1.188

Incentives/recognition programs for best performance of workers based on job descripton (Bonus, salary incremental, promotion, financial/nonfinancial incentive)	1.79	1.314

Filed survey 2018

In the survey, the respondents were asked to evaluate the status related to corrective and preventive actions and the majority of the respondents are disagreed (*M*=1.47, *SD*=1.30) that corrective action is not taken on time to illuminate causes of non-conformity in order to prevent recurrence. This indicates that there is a gap in companies in using the findings root cause analysis; corrective and preventive actions.

Concerning attribute 2, respondents are asking about whether their companies provide adequate training for the staffs based on the competency gap identified; above-average respondents disagree that (*M*=2.18, *SD* =1.24) the firm do not provide adequate training for its employee based on the competency gap analyzed. Trainings are a mandatory requirement for ISO 9001:2000 certified organizations. The training cycle goes through processes such as identification of training needs, implementation of training, training evaluation, retraining if required, and eventually going in for multi-skilling or job rotation (ISO 9001:2015 QMS requirement guidance document).

Attribute 3, TABLE 4.9 respondents are asking the frequency of training provided by their firm whether it is good and the majority of the respondent (*M*=1.92, *SD*=1.18) disagreed and they believed that the frequency of training which is provided by their firms are not enough.

This reflects firms are not that much concerned with the frequency of the training provide for their employees. To enhance the level of true value of the standard and effective implementation, it is strongly recommended that organizations need to focus on receiving training by professional organizations/institutions on the true meaning of the standard and the new changes and how these changes can affect the organization (Magd, 2008). So that the respected firms should concern such issues to develop the competency of their employee.

Concerning rewards for the best performer; Majority of respondents (*M*=1.79, *SD*=1.31) agreed that firms do not establish reward programs for best performer of their employees. This implies that organizations are not that much enthusiastic to recognize appreciation of employees for their good work done. From the interview; the general managers have agreed on this point partially. They said that they tried to implement some mechanisms to give recognition and appreciation for successful employees despite it is not that much satisfactory. Hence, it is possible to conclude that there is a gap in giving recognition and appreciation for successful employees by the companies. This study supported by Mahfouz and Saeed (2015). They stated that organizations have lack reward and motivation system. Totally when we see this performance evaluation attributes, it show as the firms have big gaps in implementing the QMS system.

4.5.5. Analysis of gaps related to continual improvement

Table 4.10 Descriptive analysis for continual improvement

Attributes	Mean	Std. Deviation

Top Management is committed to reviewing the system periodically, to ensure the adequacy and effectiveness of the system implemented	2.37	1.348
The company have internal quality audit program and audit plan that is reviewed periodically	3.33	1.245
There is a team effort to carry out cause and effect analysis	3.27	1.381
The processes of the organizations systematically monitored, evaluated and validated (Internal/external audit, management review, performance against planning & corrective actions)	2.94	1.417
Extent of employees participation in the product improvement process	3.59	1.106
Does innovative efforts are encouraged (production development & modification, process simplifying)	2.11	.946

Filed survey 2018

Based on TABLE 4.10; Attribute 1, respondents are asking about the top management is commitment in reviewing the system periodically, to ensure the adequacy and effectiveness of the system implemented in their respected firms and near to half of the respondent (*M*=2.37, *SD*=1.34) agree that top management committed to reviewing the system periodically but the remaining half of the respondents are thinking the top management not committed to reviewing the system periodically.

According to TABLE 4.10 attribute 2, the majority of the respondents (*M*=3.33, *SD*=1.24) are greed that firms have internal quality audit program and audit plan that reviewed

periodically. This infers that firms of ISO 9001 QMS certified plastic firms periodically conduct internal quality audit program and have audit plan.

According to TABLE 4.10 attribute 3, the majority of respondents (*M*=3.27, *SD*=1.38) are agreed that there is a team effort to carry out cause and effect analysis in their respected organization.This indicates there is a team effort to carry out cause and effect that are existed in a certain task or problem. Team work acts as the engine for the enforcement of quality. Tools such as quality circles, cross functioning teams, suggestion schemes, etc. serve to promote team work. Team building is as much an art as it is a skill and only those with leadership qualities can build a well join team (Nayantara 1989).

TABLE 4.10 Attributes 4 respondents are asking the processes of the organizations systematically monitored, evaluated and validated their respected organizations and most of the employee (*M*=2.94, *SD*=1.41) are agreed that the process of the organization are monitored, evaluated and validated, but it needs more effort. It needs to build capacity of an organization to gather data, measure impact, and assess lessons learned to strengthen the organization's work over time through internal/external audit, management review, measuring performance against planning & corrective actions. Markers of evaluative capacity include: Evaluation planning, data collection, measuring impact, evaluation use, learning, and continuous improvement (ISO 9001:2015 QMS requirement guidance document).

Regarding the extent of employee participation in the product improvement process, the majority of the respondents (*M*=3.5, *SD*= 1.10) are agreed that they participating in the product improvement process with a respected organization. This response rate refers there is a good participation of employees in the product improvements process.

In attribute 6; respondents are asking whether the innovative efforts are encouraged in their respected organization and the majority of the respondents (*M*=2.11, *SD*=.94) are disagree that in their organization innovative efforts are not encouraged. Most of the interview participants also accept the gaps of encouragement of innovative work in their tasks.

To come to summary, unlike to the others themes performance evaluation theme has faced a big gap; which impact the continual improvement. Unless there is continual improvement there would not be a matured system in the firm at all, So that the firm should give more attention in continual improvement by reviewing the system periodically, to ensure the adequacy and effectiveness of the system implemented.

To conclude the respondent of the employee for the remaining last two question; which is your firm's biggest concern? Cost, schedules or quality: Most of the respondents select quality 48(61.54%) and 25(32.05%) says cost, the remaining of them 5(6.4%) says schedule. This implies that the firms focus on their operation to a quality product in implement their quality policy but it needs more effort. And also there is an answer by respondents for the question; what are your firm's major problems were implementing the quality management system to be effective? From 78 respondent employees most of them write the critical problem in their firm is employee turnover, lack of resource raw materials /shortage of foreign currency/ and is lack of training based on competency gap, lack of incentives and recognition for best performance, electric power interruption, shortage of stock, shortage of spare parts and lack of transparency b/ n top management and lower employees.

4.6. A potential area of the plastic product manufacturing firms in implementing QMS

Related to the top management commitment, quality policy and quality objectives are established and communicated by the top management (*M*=3.91, *SD*=.706), top management check and reproved the availability of enough resources (*M*=3.96, *SD*=.633) and top management avail trained human resources to meet the needs (*M*=3.92, *SD*=1.289), Consideration of customers' satisfaction in strategic planning of in the firm is also good practice (*M*=3.77, *SD*=1.289).

Related to resource and communication most of respondent agrees, material (both equipment's and machineries) are available to cop up the quality management tasks (*M*=3.52, *SD*=1.450) and there are enough and qualified personnel in the firms (*M*=4.35, *SD*=1.195),there are adequate transportation/service/ for employee in your firms (*M*=3.33, *SD*=1.224), there is adequate infrastructure for operation in the firms (*M*=3.59, *SD*=.906), they have an effective & efficient process of Communication of the likes e-mail, memos, communication boards or any other in the firms (*M*=4.61, *SD*=.838). Which facilitate the operation and save time and also it saves cost. And also firms properly set documents to be visible (*M*=3.97, *SD*=1.217), which is one of communication method it is also the potential area of the firms. And also the employees agree as they accept ownership and responsibility to solve problems in the firm (*M*=4.74, *SD*=.659).

Most of employees agree in the case of customer satisfaction and quality product related questions as there is adequate of handling customer complaints quickly and positively (*M*=3.97, *SD*=1.009), there is adequate quality control system in the firms (*M*=3.97, *SD*=1.122),good availability of proper inspection techniques for process & finished products (*M*=4.36, *SD*= .946) and also as there is good level of recognizing and solving quality related problems in the firms

(*M*=4.10, *SD*=.918). Finally related to continual improvement the respondent indicates that; the firms have internal quality audit program and audit plan that are reviewed periodically (*M*=3.33, SD=1.245),there is a team effort to carry out cause and effect analysis (*M*=3.27, *SD*=1.381) and also there is good employee's participation in the product improvement process in the firm (*M*=3.59, *SD*=1.106), which are good practicing, Unfortunately, there a gap in the firm, which shows that most of the managers/owners emphasized on only they are implementing QMS and they think that they have certification (ISO 9001 certification), only and often forget to use all standards of QMS. Whereas the implementation of all standards of QMS can even improve incrementally quality/scope, reduce the cost and time length of the production, and promote customer's satisfaction. So that implementation process of QMS requires high commitment of management, repeated trainings, involvement of experts from different field of study and a considerable amount of investment and being committed to review the system periodically for continual improvement.

4.7. Reasons behind the slow trends of QMS implementation

Regarding the reasons behind the slow trends of QMS implementation, majority of managers in interview says that the most of their emphasis not only implementing QMS certification (ISO 9001 certification), and often they trying to use other standards of QMS. While the implementation of all standards of QMS can even improve incrementally quality/scope, reduce the cost and time length of the production process, and promote customer's satisfaction. This is the motives to implement QMS in their firms. But most of plastic product manufacturing firms are not certified. To sum up the interview; there was a question for managers and ISO QMS certified bodies; why the list firms only certified from 580 plastic product manufacturing firms? most of them gives the answer; awareness and promotion gap, firms awareness gap, lack

of promotion by certifying agencies and consultants, lack of promotion by government, ESA, economical factor, lack of regulation and policy framework are the major factors for the reason most of firms are not certified ISO QMS standards.

- **Awareness and promotion gap**

According to interviews with certified body; awareness and promotion is the main driving force in current business environment. The primary initiation to perform something comes from the awareness level what that particular body perceived and understands. Therefore, the current poor quality situation that exist in our country is primarily emanates from the awareness and understanding gap towards quality and standardization.

- **Companies awareness Gap**

Most companies focus on product certification instead of system certification and they do not realize the significance of system standardization. They perceived that they can achieve the market demand by ordinary production system without having any system certification like ISO 9001 or implementing other system standards. In connection with the above issue companies believed that the people interest towards quality is very poor due to this they do not give value for quality in the market instead focus on price. Hence, companies perceived it is meaningless for them using standards instead they focus on market price and other competition factors. In addition companies do not recognize the role of standardization to enhance their organizational effectiveness and efficiency due to this they only focus on the market issues instead of enhancing their organizational effectiveness and efficiency.

- **Lack of promotion by certifying agencies**

To meet an apex of certification system there must be a coordinated and joint effort of stockholders like certifying agency, regulatory body etc. however, there is a wide gap coordination between these bodies to promote the significance of quality and standardization. They all work in disintegrated manner even there is no any opportunity for certifying agencies to promote their task as well as issues related to quality.

- **Lack of promotion by government, ESA**

ESA is the primary authorized body to work on quality and standardization in the country by coordinating various responsible bodies. However, there is no clear strategy on awareness and promotion and still there is an inconsistent awareness and promotion system about quality and standardization through various electronic, printing Medias or other potential mechanism.

- **Economical factor**

Economy also another factor with regards to standards. ISO certifications should be weighed against the number of potential ISO certifiable enterprises in each country, and by industry structure of enterprises, in order to ascertain the degree of diffusion within the economy.

- **Lack of regulation and policy framework**

Establishing proper policy framework and strengthening government's supervision are the major required tools to perform any activity.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter presents a summary of findings, conclusions, and recommendations extracted from the previous chapter and the researcher point out the fundamental issues in

relation to the implementation of ISO 9001 quality management system in plastic manufacturing firms. The following major findings are observed from the discussion and analysis part.

5.2. Summary of the findings

5.2.1. Gaps related to QMS practice in plastic product manufacturing firms

Top management do not give special attentions for product realization processes which can add values to demonstrate the required final product of any label of quality since the mean is below the clear cut point (*M*<= 3). Majority of the respondent (*M*=1.28, *SD*=1.054) agreed that companies do not provide adequate and updated information about the company their employees. Majority of the respondents (*M*= 1.73, *SD* =1.25) agreed that companies do not give considerable attention for hazardous jobs to minimize the risk by exercising more safety procedures. In continual improvement attribute majority of the respondents (*M*=1.47, *SD*=1.30) agreed that corrective action are not taken on time to illuminate causes of non-conformity in order to prevent recurrence. This indicates that there is a gap in companies in using the findings root cause analysis; corrective and preventive actions. And also in performance evaluation attribute majority of the respondent (*M*=1.92, *SD*=1.18) disagreed and they believed that the frequency of training which is provided by their company are not enough and this reflects companies are not that much concerned on the frequency of the training provide for their employees. Majority of the respondents (*M*=1.79, *SD*=1.314) agree that incentive/recognition programs for best performance of worker are not adequate. This is also the gaps which are the cause of employee turnover and not motivated to work.

5.2.2. Potential areas of QMS practice in plastic product manufacturing firms

QMS certified plastic firms have good potential in top management commitment, quality policy and quality objectives are established and communicated by the top management, top management check and reproved the availability of enough resources and also as respondent employees; top management avail trained human resources to meet the needs.

Related to resource and communication attributes most of the respondent agrees; there is enough and qualified personnel in the company, there is adequate infrastructure for operation in the firms, they have an effective & efficient process of Communication of the likes e-mail, memos, communication boards or any other in the firms. Which facilitate the operation and save time and also it saves cost. And also the firms properly set documents to be visible, which is one of communication method it is also the potential area of the firms. And also the employees agree as they accept ownership and responsibility to solve problems in the firm, and also the managers agree with this employee's acceptance.

Most of the employees agree in the case of customer satisfaction and quality product related questions as there is adequate of handling customer complaints quickly and positively, there is adequate quality control system in the company, good availability of proper inspection techniques for process & finished products and also as there is good level of recognizing and solving quality related problems in the firms. Finally related to continual improvement the respondent indicates that; there is a team effort to carry out cause and effect analysis and also there is adequate employee's participation in the product improvement process in the firm.

5.3. Conclusions

The successful implementation of quality management system programs depends on the workforce. If plastic manufacturing firms would have more trained, involved and empowered employees it is more likely to realize benefits of implementation of quality management techniques. Even though companies tried to conduct an internal audit as per schedule but there is a gap in taking corrective and preventive actions without the undue delay, to eliminate the causes of nonconformities in order to prevent recurrence. This shows that, the gap in related to continual improvement. And also there is a gap in quality product and performance evaluation, but the firms also have potential area when implementing QMS; which indicates that, there is QMS practice in the firms at all but it needs more attention to satisfy the internal and external customer. The PDCA cycle returns to the plan stage to search for other improvement plans that may have better effects. If the implementation of the improvement plan has produced the preferred results, the firm should consider how to strengthen the results. Hence, the PDCA cycle continues forever in the never ending improvement. Generally the management of plastic product manufacturing firms should be more involved in continual improvement programs in order to be competitiveness and to keep there quality image in local and global market.

5.4. Recommendations

This study recommends that; Plastic product manufacturing firms should focus their workforce, develop their competence gaps by giving training and also motivate them by giving promotion and incentives based on their evaluation. And the firms must be given more emphasis to the PDCA cycle for continual improvement of the system and to achieve the firm's quality goal. Since there are gaps in relation to employee involvement, continual

improvement in related to performance evaluation; companies shall work on these issues with special attention.

The typical objective of having ISO certified is producing products that consistently meet customer needs, reducing costs and waste and increasing confidence in the production systems capability. Therefore, before going for certification checking the motive, status and weakness of the company that must be amended is a recommendable concern. And the level of communication needs to be improved; unless and otherwise, employees participate one way or another way it is difficult for the organization to achieve its objectives. Hence the top management needs to establish an open environment that gives an opportunity to employees to communicate their ideas.

The top management needs to give a special attention to product realization process. Since it is the heart process for any manufacturing firm; the top management needs to improve the product realization process by increasing the awareness of employees as well as by implementing product realization procedures effectively. And also firms need to conduct a hazard analysis and after identifying the potential risk, they should put safety requirement and implementing personal protective equipment procedures effectively.

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APPENDEXI

APPENDIX I

Questionnaire to be filled by ISO QMS Certified plastic product manufacturing firm employees

MASTERS OF SCIENCEADDIS ABABA SCIENCE AND TECHNOLOGY UNIVERSITY

Dear respondents, I am a postgraduate student of the Addis Ababa science and technology university and currently undertaking a research on assessment of quality management system and its practice in plastic industries: the case of Addis Ababa area. So that the purpose of this questionnaire is to identify QMS associated gaps, to examine where the firms need more attention and to identify the potential area for improvement and value due implement QMS to

give appropriate solutions so that the business can be competitive in the domestic as well as global market.

As you are one of very prominent worker of the company I kindly request you to give us the following information genuinely. Mean while, the outcome of this study will highly depend on your sincere and timely response.

If you have any questions or comments, please contact Desalegn Sete Tefera (Mobile-0913973137 or email- zazamank006@gmail.com). Thank you in advance for your cooperation.

General instruction:

- No need to write your name.
- Respond to each question by putting (√) mark to your choice and clearly state your ideas in the blank spaces provided.
- Please, do not leave the open-ended question unanswered.

Part 1: Demographic information

Sex Male ☐ Female ☐

Educational background Certificate ☐ Diploma (Level IV and Level V) ☐

BA/BSc ☐ Above BA/BSc ☐

Service year in your enterprise

Less than 1 year ☐ 2 -5 years ☐

6 - 10 years ☐ Above 10 years ☐

Work Position in the company Quality department ☐

Production department ☐

Marketing department ☐

Purchasing and logistics department ☐

Maintenance department ☐

☐

Finance department

Other (please specify) ……

Part 2: Dear respondents; this part contains questions related to on the practice of QMS; please express your level of agreement/disagreement in the five point scale.

A	**Questions related top management commitment**	5-Strongly agree	4-Agree	3-Neutral	2-Disagree	1-Strongly disagree
1	Top management identifies the product realization processes which can add values	☐	☐	☐	☐	☐
2	Quality policy and quality objectives are established and communicated by the top management(putting as document, make banner & visible to all, discussion)	☐	☐	☐	☐	☐
3	The top management checked and reproved the availability of enough resources	☐	☐	☐	☐	☐
4	The top management avail trained human resources meet the needs	☐	☐	☐	☐	☐
5	Consideration of customers' satisfaction in strategic planning of your company	☐	☐	☐	☐	☐

6	Established open environment to all employees to participate in meeting the organization's goals.	☐	☐	☐	☐	☐
C	**Questions related to resource and communication**					
8	Material (both equipments and machineries) are available to cop up the quality management tasks(financial money, nonfinancial; laboratory instruments, modern technological machineries)	☐	☐	☐	☐	☐
8	There are enough and qualified personnel in the company	☐	☐	☐	☐	☐
9	There is adequate infrastructure for operation in your company(buildings, equipment, IT systems, transport)	☐	☐	☐	☐	☐
10	There are a adequate transportation/service/ for employee in your company	☐	☐	☐	☐	☐
11	Does the company have an efficient process of Communication of the likes e-mail, memos, communication boards or any other	☐	☐	☐	☐	☐
12	Does the company properly set documents to be visible	☐	☐	☐	☐	☐
13	You get adequate and updated information about your company	☐	☐	☐	☐	☐
14	I am a part of the team, which manages process performance and evaluates the	☐	☐	☐	☐	☐

	results					
15	I accept ownership and responsibility to solve problems	☐	☐	☐	☐	☐
D	**Questions related to quality production and customer satisfaction**					
16	The company have a procedure for evaluating suppliers	☐	☐	☐	☐	☐
17	Degree of communication of your company with its customers	☐	☐	☐	☐	☐
18	Extent of handling customer complaints quickly and positively	☐	☐	☐	☐	☐
19	Customers' satisfaction with the quality of your products (customer compliments & number of repeat customers)	☐	☐	☐	☐	☐
20	Your company gives customer technical support(trainings, maintenance, information about the product)	☐	☐	☐	☐	☐
21	Jobs which are hazardous require more safety (dusts, cutters, chemicals)	☐	☐	☐	☐	☐
22	Extent to which quality data are used as tools to manage quality	☐	☐	☐	☐	☐
23	There is adequate quality control system in the company (records, production follow-up, sample tasting periodically)	☐	☐	☐	☐	☐
24	Degree of availability of proper	☐	☐	☐	☐	☐

	inspection techniques for process & finished products					
25	Extent to which inspection, review or checking of work is automated	☐	☐	☐	☐	☐
26	Level of recognizing and solving quality related problems in the company (scrapping, supplying under concession, alternative uses, product rework or recall)	☐	☐	☐	☐	☐
27	All workers are responsible for the quality of products	☐	☐	☐	☐	☐
E	**Questions related to performance evaluation**					
28	Corrective actions are taken without the undue delay, to eliminate the causes of nonconformities in order to prevent recurrence	☐	☐	☐	☐	☐
29	Adequate trainings are provided for the staffs based on the competency gap identified (QMS, internal audit, GMP trainings)	☐	☐	☐	☐	☐
30	Does the frequency of training is good enough as identification of training needs & retraining if required	☐	☐	☐	☐	☐
31	Incentives/recognition programs for best performance of workers based on job description (Bonus, salary incremental,	☐	☐	☐	☐	☐

	promotion, financial/nonfinancial incentive)					
F	**Questions related to continual improvement**					
32	Top Management is committed in reviewing the system periodically, to ensure the adequacy and effectiveness of the system implemented	☐	☐	☐	☐	☐
33	The company have internal quality audit program and audit plan that are reviewed periodically	☐	☐	☐	☐	☐
34	There is a team effort to carry out cause and effect analysis	☐	☐	☐	☐	☐
35	The processes of the organizations systematically monitored, evaluated and validated (Internal/external audit, management review, performance against planning & corrective actions)	☐	☐	☐	☐	☐
36	Extent of employees participation in the product improvement process	☐	☐	☐	☐	☐
37	Does innovative efforts are encouraged (production development & modification, process simplifying)	☐	☐	☐	☐	☐

38. Which is your company the biggest concern?

A. Cost B. Schedules C. Quality

39. What are your company problems to implement the quality management system effectively?

_____

_____

_____

_____

_____

APPENDIX II

Interview with QMS certified plastic product manufacturing certified firm managers

1. What were the motives for implementing QMS?

2. What is the overview of the practices of QMS in your organization?

3. Is the company provided enough resource (human, material and financial) to meet the quality objective /Intended Objectives?

4. Are the employees are well involved in various aspects to realize the quality objectives? What are the indicators?

5. Is there adequate training? Is training's technically fit to meet the quality objective?

6. Does the internal audit and management review very capable to assure the continual improvement? In what ways can QMS practices be further/continuously improved?

APPENDIX III

Table 3.1 Reliability test

Variables	Cronbach's Alpha	N of Items
Top management commitment	0.825	6
Resource and communication	0.959	9
Quality product & customer focus	0.979	12
Performance evaluation	0.976	4
Continual improvement	.976	6
Over all reliability	.992	37

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